

# Oroville Facilities Relicensing FERC Project No. 2100

## Fisheries Activities

Oroville, California

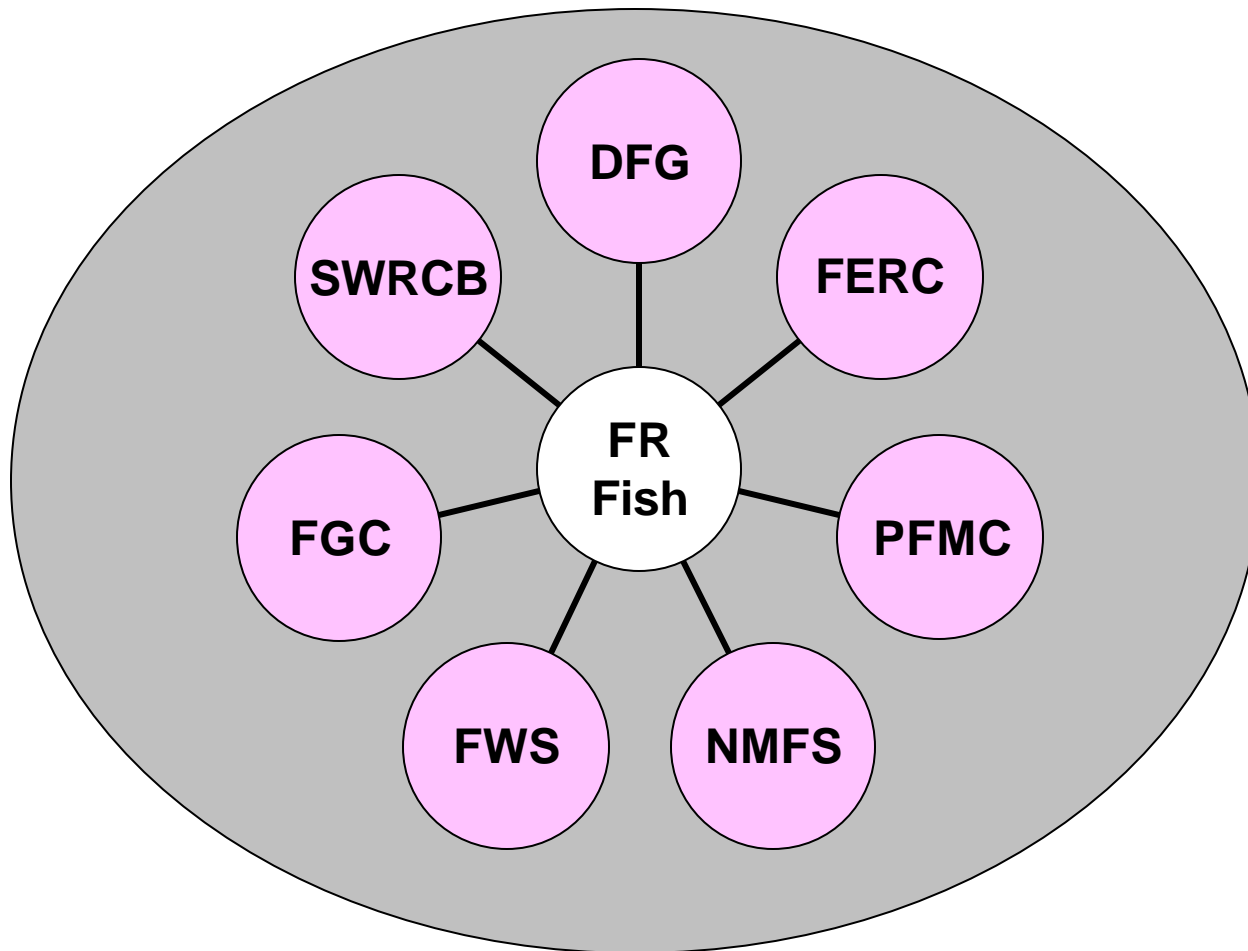
November 19, 2002



# Objectives

- Update Members of the Plenary Group on DWR FERC Related Fishery Activities
- Answer Questions

# Some of the Regulatory Players



# Department of Fish and Game

- California Endangered Species Act
- Black Bass Conservation and Enhancement
- Native Species Conservation and Enhancement
- Salmon, Steelhead Trout, and Anadromous Fisheries Program Act

# Fish and Game Commission

- Regulate take of fish and wildlife
- Set seasons and limits
- List species under CESA
- Regulate fisheries within 3 miles of coastline

# Fish and Wildlife Service

- Endangered Species Act of 1973
- Fish and Wildlife Coordination Act
- Central Valley Project Improvement Act

# National Marine Fisheries Service

- Endangered Species Act of 1973
- Sustainable Fisheries Act
- Magnuson-Stevens Fishery Conservation and Management Act
  - Essential Fish Habitat

# Pacific Fishery Management Council

- Established by the Magnuson-Stevens Fishery Conservation and Management Act
- Regulate ocean fisheries off Coasts of California, Oregon and Washington from 3 to 200 miles offshore



# State Water Resources Control Board

- Water Rights
- Porter-Cologne Water Quality Control Act

# Federal Energy Regulatory Commission

- Independent Regulatory Agency within the Department of Energy
- Implements Federal Power Act of 1935
- Licenses and inspects private, municipal and state hydroelectric projects

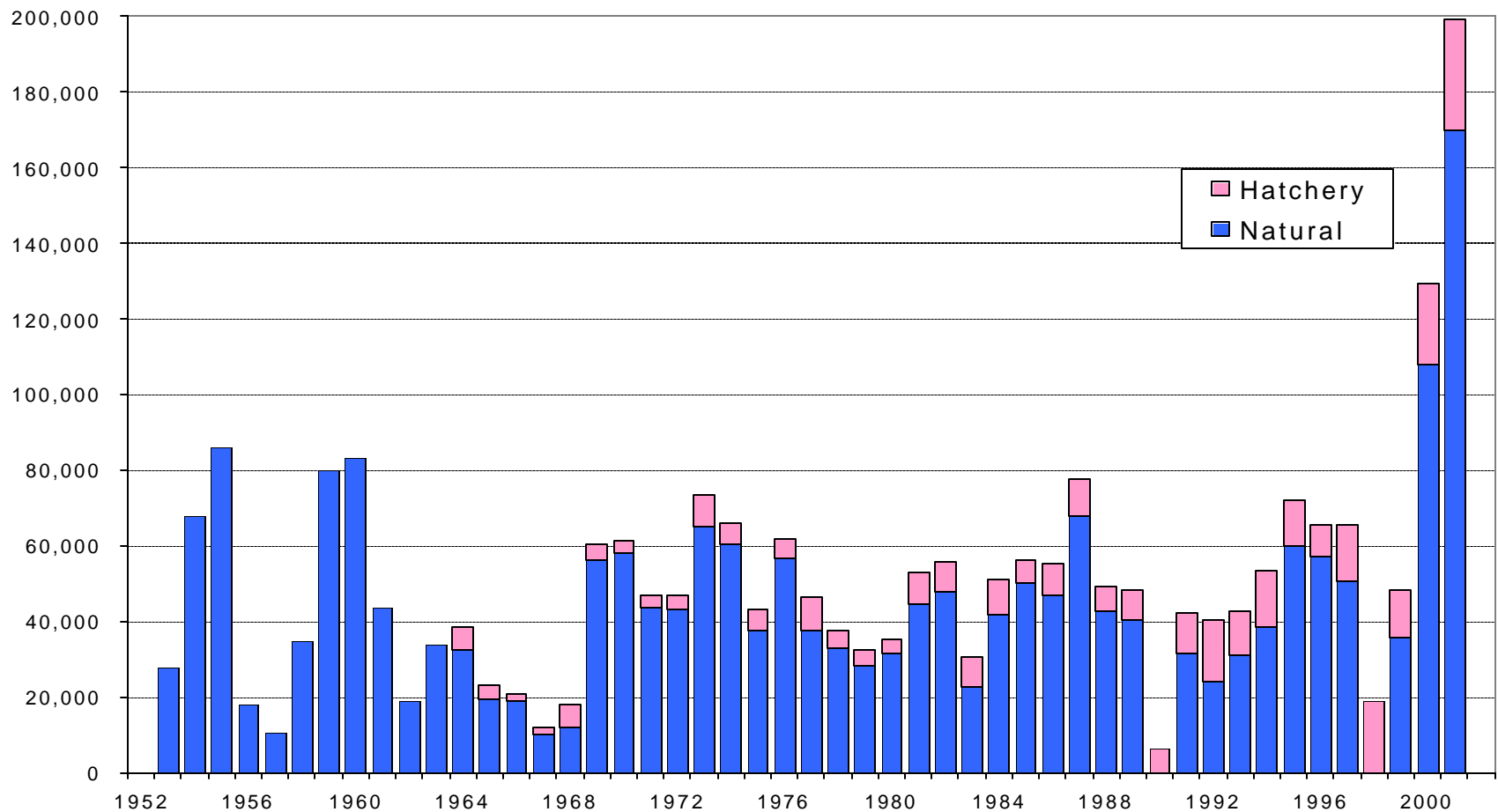
# Types of Fisheries and Fish

- Lake
- Stream
- River
- Warm water
- Cold water
- Anadromous
- Rainbow trout
- Black bass
- Sturgeon
- Steelhead
- Chinook salmon
- American shad
- Striped bass

# Types of Fishery Information

- Abundance (how many)
- Distribution (where are they)
- Size
- Age (adult/juvenile)
- Temporal (when are they present)
- Health
- Harvest

# Example: Fall-run Chinook Returns Feather River 1953-2001



# DWR Fish Studies

- Purpose:
  - To understand the lives of fish in the river
  - To understand the influence of environmental features (including the Oroville Facilities) on those fish

# DWR Fish Studies

- Studies examine five areas
  - Upstream migration and spawning
  - Juvenile period
  - Downstream migration
  - Hatchery fish
  - Other, including topics that cross categories

# DWR Fish Studies

- Study initiation:
  - Some started before the collaborative and have continued
  - Others started after the collaborative formed



# Upstream Migration and Spawning

- Each year we (with DFG) track:
  - How many salmon arrive
  - When they arrive
  - Which parts of the river they use
  - How many spawn
  - Whether any nests are left high and dry

# Juvenile Period

- We track the following:
  - What geographic and topographic parts of the river the juveniles use
  - Their survival rate (by tagging them)
  - growth rate
  - Incidence of stranding in ponds
  - What they eat and where they get it (CSU Chico)

# Downstream Migration

- Track how long salmon stay in the river
- How many head downstream
- Their size at departure
- What conditions cause them to leave

# Hatchery Fish

- Mainly by tagging hatchery fish and recovering tags, we (with DFG) learn the survival rate, contribution to the commercial and sport catch, and incidence of straying (to non-natal streams)
- Estimate genetic similarity between hatchery and wild fish and genetic relationship among seasonal runs of salmon (UC Davis)

# Other Topics

- Incidence, spread, causes and control of disease, including any nexus to the operation of the hatchery or the fish stocking programs (mainly DFG)
- Use bone chemistry to tell hatchery from wild fish and Feather River natives from strays (UC Berkeley)
- Surveys to determine distribution and habitat use by all fish species in the river

# DWR Fish Studies that Started Later

- Studies examine five areas
  - Upstream migration and spawning
  - Juvenile period
  - Downstream migration
  - Hatchery fish
  - Other, including topics that cross categories

# Upstream Migration and Spawning

- Environmental factors that encourage or discourage upstream migration
- Extent and quality of spawning gravel
- Surveys for steelhead spawners and nests
- Surveys for egg and larval sturgeon
- Estimate nutritional value of salmon carcasses in historic upstream spawning grounds
- Evaluate feasibility of getting salmon, steelhead and sturgeon past Oroville Dam (both up- and downstream)

# Juvenile Period

- Effects of water temperature on growth and survival of steelhead
- Project effects on predators of juvenile salmon and steelhead
- Project effects on suitability of habitat for juvenile fish—depth, velocity, channel shape etc
- Surveys of salmon rearing sites along the entire Feather River



# Downstream Migration

- Effects of environmental conditions on downstream migration—via computer model

# Hatchery Fish

- Review of other studies on impacts of hatcheries on naturally spawning salmon and steelhead, including differences in behavior and survival between hatchery and wild fish
- Spring arrival schedule and numbers for steelhead and salmon at the hatchery
- Proportion of hatchery fish that spawn in the river
- Examine potential changes to hatchery practices e.g., releasing juveniles in the river

# Other Topics

- Measure distribution and abundance of invertebrates (fish food) and project effects on them
- Document life history and habitat preference of all fish in the river
- Surveys to estimate potential spawning areas for splittail minnow



# 1994 FERC ORDER

- FISH HATCHERY EXPANSION
- FISH HABITAT ENHANCEMENT PROGRAM
- SALMONID STOCKING
- FISHERY STUDY
- RECOMMENDATIONS FOR FUTURE FISH STOCKING TO BE SENT TO FERC
- COMMENTS FROM 5 FISHERY ORGANIZATIONS
  - DFG
  - USFWS
  - BBAC
  - LOFEC
  - CSPA



# Fish Hatchery Expansion



# Fish Habitat Enhancement





# Salmonid Stocking





# Fishery Study



# Florida Strain Largemouth Bass

